Complete Summary

GUIDELINE TITLE

WGO practice guideline: acute diarrhea.

BIBLIOGRAPHIC SOURCE(S)

World Gastroenterology Organisation (WGO). WGO practice guideline: acute diarrhea. Munich, Germany: World Gastroenterology Organisation (WGO); 2008 Mar. 28 p.

GUIDELINE STATUS

This is the current release of the guideline.

WGO Guidelines are constantly reviewed and updates are built when new information becomes available.

** REGULATORY ALERT **

FDA WARNING/REGULATORY ALERT

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory information has been released.

- July 08, 2008 – Fluoroquinolones (ciprofloxacin, norfloxacin, ofloxacin, levofloxacin, moxifloxacin, gemifloxacin): A BOXED WARNING and Medication Guide are to be added to the prescribing information to strengthen existing warnings about the increased risk of developing tendinitis and tendon rupture in patients taking fluoroquinolones for systemic use.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Acute diarrhea

GUIDELINE CATEGORY

Diagnosis
Evaluation
Management
Prevention
Risk Assessment
Treatment

CLINICAL SPECIALTY

Family Practice
Gastroenterology
Infectious Diseases
Internal Medicine
Nutrition
Pediatrics

INTENDED USERS

Allied Health Personnel
Dietitians
Nurses
Physician Assistants
Physicians
Public Health Departments

GUIDELINE OBJECTIVE(S)

To provide a guideline for management, treatment, and prevention of acute diarrhea that is as globally relevant and accessible as possible

TARGET POPULATION

Children and adults with acute diarrhea

INTERVENTIONS AND PRACTICES CONSIDERED

Evaluation and Diagnosis

1. Clinical evaluation of acute diarrhea
    - History
    - Physical examination
    - Severity of diarrhea

- Assessment of hydration status
- Incubation period

2. Laboratory evaluation
   - Epidemiologic clues
   - Fecal specimen analysis and culture
   - Serum electrolyte (children only)
3. Prognostic factors and differential diagnosis
4. Resource-available diagnosis

Treatment and Management

1. Treatment of dehydration
   - Oral rehydration therapy (ORT)
     - Oral rehydration salt (ORS) solution
     - Replacement of losses (water and electrolytes)
   - Nutrition
     - Nutritional supplements (e.g., zinc, multivitamin)
     - Age appropriate diet
2. Pharmacologic treatment (mostly for adults)
   - Antimotility agents
   - Antisecretory agents
   - Adsorbents
   - Antimicrobials
3. Home management versus in-patient care
4. Resource-available therapy

Prevention

1. Sanitation and hygiene
2. Safe food
3. Nutritional supplements
4. Vaccines

MAJOR OUTCOMES CONSIDERED

- Duration of symptoms
- Childhood morbidity (e.g., diminished growth, impaired cognitive development)
- Incidence of comorbidity (e.g., human immunodeficiency virus [HIV])
- Mortality
- Cost of treatment

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

World Gastroenterology Organization's (WGO's) Graded Evidence System

WGO's Grading Evidence System is built to help National Societies of Gastroenterology and all those interested in the practice and research of gastroenterology, keep track of the literature in topics covered by WGO Guidelines.

Evidence is classified into three categories:

- Systematic reviews, consensus statements, meta-analyses, evidence-based practice guidelines
- Clinical trials
- Other reading

The following journals are scanned for new evidence:

- Gastroenterology
- Annals of Internal Medicine
- Hepatology
- GUT
- Journal of Hepatology
- Alim. pharmacology & therapeutics
- American Journal of Gastroenterology
- Inflammatory Bowel Disease
- Gastrointestinal Endoscopy
- J. of Pediatric Gastroenterology & Nutrition
- Digestion
- Scandinavian Journal of Gastroenterology
- Eur. J. of Gastroenterology and Hep.
- Digestive Diseases and Sciences
- Endoscopy
- J. of Gastroenterology and Hepatology
- Digestive Surgery
- Digestive Diseases

Plus a selection from the general journals:

- New England Journal of Medicine
- JAMA
- Lancet
- BMJ
- Nature
- Science

Coverage

Graded Evidence is an iterative process—and for that reason need not be so concerned with searching both Medline, Embase and Biosis for example. All top gastrointestinal (GI) journals are covered by both Medline and Embase and in single one-off complex searches unique citations in one or the other are often due either to differences in database currency or differences in coverage of less

important journals. In addition to cost issues, the generous republishing and copyright policies of the US National Library of Medicine (NLM) make Medline the preferred choice.

Search Strategies

Search strategies for each topic are based on a combination of controlled access and free text terms. The strategies aim for "precision" rather than "sensitivity." Busy gastroenterologists probably prefer very precise search strategies in top GI journals and thus make sure every major article is found. The WGO Graded Evidence works along the lines of PUBMED Medline "Clinical queries" features. Precise searches only find relevant information. Indexing errors may still be responsible for irrelevant or duplicate records. Case studies and animal studies are not usually included.

Finding Evidence

True evidence-based searches require a deeper understanding of databases and search strategies not necessary for our purpose. WGO Global Guidelines are not systematic reviews. The WGO Library adheres to the Cochrane Collaboration's views that a searcher has to work through a hierarchy of evidence as follows.

- Cochrane Collaboration Systematic Reviews
- DARE Systematic Reviews
- Randomized Clinical Trials (e.g., in the Cochrane Controlled Clinical Trials Database)

As you move down the hierarchy you are more likely to find "opinion" instead of evidence. For a more complete search on a topic please consult also:

- National Guideline Clearinghouse
- National Society Guideline Publications
- PUBMED Medline

Guideline Specific Methodology

Existing evidence was searched using a precise, rather than sensitive syntax for each platform searched. Relevant guidelines were searched in the National Guideline Clearinghouse platform at www.ngc.org and on the web sites of the major gastroenterology (GI) and cancer societies. Further searches were carried out in Medline and Embase on the Dialog-DataStar platform from 2002 onwards. A search in the Cochrane Library gathered all relevant systematic reviews and protocols.

NUMBER OF SOURCE DOCUMENTS

- 26 meta-analyses, systematic reviews, and practice guidelines
- 26 clinical trials
- 9 other readings

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

METHODS USED TO ANALYZE THE EVIDENCE

Review
Review of Published Meta-Analyses

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

This guideline was written by the review team after a series of literature searches were carried out to establish what had changed since the World Gastroenterology Organization's (WGO) first position statement on the topic of acute diarrhea, published in 2002.

The draft was edited by the chairperson of the review team and the librarian.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Not stated

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not applicable

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Clinical Manifestations and Diagnosis

Despite clinical clues, determining the causative agent of diarrhea in an individual patient on the basis of clinical grounds alone is usually difficult.

Episodes of diarrhea can be classified into three categories:

Acute diarrhea	• Presence of three or more loose, watery stools within 24 hours
Dysentery	• Bloody diarrhea, visible blood and mucus present
Persistent diarrhea	• Episodes of diarrhea lasting more than 14 days

Table: Linking the Main Symptoms to the Causes of Acute Diarrhea

Fever	• Common and associated with invasive pathogens
Bloody stools	• Invasive and cytotoxin releasing pathogens • Suspect Enterohemorrhagic *Escherichia (E.) coli* (EHEC) infection in the absence of fecal leukocytes • Not with viral agents and enterotoxins releasing bacteria
Vomiting	• Frequently in viral diarrhea and illness caused by ingestion of bacterial toxins (e.g., *Staphylococcus aureus*).

See Table 3 in the original guideline document for clinical features of infection with selected diarrheal pathogens.

Clinical Evaluation

The initial clinical evaluation of the patient (see "Table: Levels of Dehydration in Children with Acute Diarrhea" below) should focus on:

- Assessing the severity of the illness and the need for rehydration
- Identifying likely causes on the basis of the history and clinical findings

Table: Evaluation of the Acute Diarrhea Patient

History	Physical Examination	Assess Dehydration
• Onset frequency, quantity • Character - bile/blood/mucus • Vomiting • Past medical history, underlying medical conditions • Epidemiological clues	• Body weight • Temperature • Heart & respiratory rate • Blood pressure	• General appearance, alertness • Pulse and blood pressure • Postural hypotension • Mucous membranes and tears • Sunken eyes, skin turgor • Capillary refill, jugular venous pressure • Sunken fontanelle

Table: Levels of Dehydration in Children with Acute Diarrhea

No Dehydration	Mild Dehydration (≥2 signs)	Severe Dehydration (>2 signs)
• Alertness normal • No sunken eyes • Normal drinking • Immediate skin pinch	• Restless or irritable • Sunken eyes • Drinks eagerly • Slow skin pinch (<2 sec)	• Abnormally sleepy or lethargic • Sunken eyes • Drinking poorly or not at all • Very slow skin pinch (>2 sec)

Cautionary note: Being lethargic and sleepy are *not* the same. A lethargic child is not simply asleep: the child's mental state is dull and the child cannot be fully awakened; the child may appear to be drifting into unconsciousness. In some infants and children, the eyes normally appear somewhat sunken. It is helpful to ask the mother if the child's eyes are normal or more sunken than usual. The skin pinch is less useful in infants or children with marasmus or kwashiorkor, or obese children. Other signs that may be altered in children with severe malnutrition are described in section 8.1 of the World Health Organization (WHO) 2005 Guideline.

Signs of dehydration in adults:

- Pulse rate >90
- Postural hypotension
- Supine hypotension and absence of palpable pulse
- Dry tongue
- Sunken eyeballs

- Skin pinch

Laboratory Evaluation

For acute enteritis and colitis, maintaining adequate intravascular volume and correcting fluid and electrolyte disturbances take priority over the identification of the causing agent. Stool cultures are usually unnecessary for immunocompetent patients who present within 24 hours after the onset of acute, watery diarrhea. Microbiologic investigation is indicated in patients who are dehydrated or febrile or have blood or pus in their stool.

Epidemiologic clues to infectious diarrhea can be found by evaluating the incubation period, history of recent travel, unusual food or eating circumstances, professional risks, recent use of antimicrobials, institutionalization, and human immunodeficiency virus (HIV) infection risks.

Stool analysis and culture costs can be reduced by improving the selection and testing of the specimens submitted on the basis of interpreting the case information — such as patient history, clinical aspects, visual stool inspection, and estimated incubation period for: (1) patient history details and causes of acute diarrhea, (2) the incubation period and likely causes of diarrhea, and (3) details on obtaining a fecal specimen for analysis in cases of severe, bloody, inflammatory, or persistent diarrhea, or if an outbreak is suspected, see Figures 7-9, respectively, in the original guideline document.

(Screening usually refers to noninvasive fecal tests.) The identification of a pathogenic bacterium, virus, or parasite in a stool specimen from a child with diarrhea does not indicate in all cases that it is the cause of illness.

Certain laboratory studies may be important when the underlying diagnosis is unclear or diagnoses other than acute gastroenteritis are possible.

Measurement of serum electrolytes is only required in children with severe dehydration or with moderate dehydration and an atypical clinical history or findings. Hypernatremic dehydration requires specific rehydration methods — irritability and a doughy feel to the skin are typical manifestations and should be sought specifically.

Prognostic Factors and Differential Diagnosis

Table: Prognostic Factors in Children

Malnutrition • Approximately 10 percent of children in developing countries are severely underweight. • Macronutrient or micronutrient deficiencies in children are related with more severe and prolonged diarrhea. • A poor nutritional status causes an elevated risk for diarrheal death.

Zinc Deficiency • Suppresses immune system function and is associated with an increased prevalence of persistent diarrhea
Persistent Diarrhea • Often results in malabsorption and significant weight loss, further promoting the cycle
Immunosuppression • Secondary to infection with HIV or other chronic conditions may have an increased risk for the development of clinical illness, prolonged resolution of symptoms, or frequent recurrence of diarrheal episodes

Differential diagnosis of acute diarrhea in children:

- Meningitis
- Bacterial sepsis
- Pneumonia
- Otitis media
- Urinary tract infection

Treatment Options and Prevention

Rehydration

Oral rehydration therapy (ORT) is the administration of fluid by mouth to prevent or correct dehydration that is a consequence of diarrhea. ORT is the standard for efficacious and cost-effective management of acute gastroenteritis, also in developed countries.

Oral rehydration salt (ORS) solution is the fluid specifically developed for ORT. A more effective, lower-osmolarity ORS (with reduced concentrations of sodium and glucose, associated with less vomiting, less stool output, and a reduced need for intravenous infusions in comparison with standard ORS) has been developed for global use (see Table 4 in the original guideline document). The hypotonic WHO-ORS is also recommended for use in treating adults and children with cholera. ORT consists of:

- Rehydration — water and electrolytes are administered to replace losses
- Maintenance fluid therapy (along with appropriate nutrition)

In children who are in hemodynamic shock or with abdominal ileus, ORT may be contraindicated. For children who are unable to tolerate ORS via the oral route (with persistent vomiting), nasogastric (NG) feeding can be used to administer ORS.

Global ORS coverage rates are still less than 50%, and efforts must be made to improve coverage.

Rice-based ORS is superior to standard ORS for adults and children with cholera, and can be used to treat such patients wherever its preparation is convenient. Rice-based ORS is not superior to standard ORS in the treatment of children with acute noncholera diarrhea, especially when food is given shortly after rehydration, as is recommended to prevent malnutrition.

Supplemental Zinc Therapy, Multivitamins, and Minerals

For all children with diarrhea: 20 mg zinc for 14 days

Zinc deficiency is widespread among children in developing countries. Micronutrient supplementation — supplementation treatment with zinc (20 mg per day until the diarrhea ceases) reduces the duration and severity of diarrheal episodes in children in developing countries.

Supplementation with zinc sulfate (2 mg per day for 10 to 14 days) reduces the incidence of diarrhea for 2 to 3 months. It helps reduce mortality rates among children with persistent diarrheal illness. Administration of zinc sulfate supplements to children suffering from persistent diarrhea is recommended by the WHO.

All children with persistent diarrhea should receive supplementary multivitamins and minerals each day for 2 weeks. Locally available commercial preparations are often suitable; tablets that can be crushed and given with food are least costly. These should provide as broad a range of vitamins and minerals as possible, including at least two recommended daily allowances (RDAs) of folate, vitamin A, zinc, magnesium, and copper.

As a guide, one RDA for a child aged 1 year is:

- Folate: 50 micrograms
- Zinc: 20 micrograms
- Vitamin A: 400 micrograms
- Copper: 1 mg
- Magnesium: 80 mg

Diet

The practice of withholding food for >4 hours is inappropriate. Food should be started 4 hours after starting ORT or intravenous fluid. The notes below apply to adults and children unless age is specified.

Give:

- An age-appropriate diet — regardless of the fluid used for ORT/maintenance
- Infants require more frequent breast feedings or bottle feedings — special formulas or dilutions unnecessary

- Older children should be given appropriately more fluids
- Frequent, small meals throughout the day (six meals/day)
- Energy and micronutrient-rich foods (grains, meats, fruits, and vegetables)
- Increasing energy intake as tolerated following the diarrheal episode

Avoid:

- Canned fruit juices — these are hyperosmolar and can aggravate diarrhea.

Probiotics are specific defined live microorganisms, such as *Lactobacillus* GG (American Type Culture Collection [ATCC] 53103), which have demonstrated health effects in humans. Controlled clinical intervention studies and meta-analyses support the use of specific probiotic strains and products in the treatment and prevention of rotavirus diarrhea in infants. However, all effects are strain-specific and need to be verified for each strain in human studies. Extrapolation from the results of even closely related strains is not possible, and significantly different effects have been reported.

Nonspecific Antidiarrheal Treatment

None of these drugs addresses the underlying causes of diarrhea. Antidiarrheals have no practical benefits for children with acute/persistent diarrhea. Antiemetics are usually unnecessary in acute diarrhea management.

Antimotility:

- Loperamide is the agent of choice for adults (4 to 6 mg/day; 2 to 4 mg/day for children >8 years).
- Should be used mostly for mild to moderate traveler's diarrhea (without clinical signs of invasive diarrhea).
- Inhibits intestinal peristalsis and has mild antisecretory properties.
- Should be avoided in bloody or suspected inflammatory diarrhea (febrile patients).
- Significant abdominal pain also suggests inflammatory diarrhea (this is a contraindication for loperamide use).
- Loperamide is not recommended for use in children <2 years.

Antisecretory agents:

- Bismuth subsalicylate can alleviate stool output in children or symptoms of diarrhea, nausea, and abdominal pain in traveler's diarrhea.
- Racecadotril is an enkephalinase inhibitor (nonopiate) with antisecretory activity, and is now licensed in many countries in the world for use in children. It has been found useful in children with diarrhea, but not in adults with cholera.

Adsorbents:

- Kaolin-pectin, activated charcoal, attapulgite
    - Inadequate proof of efficacy in acute adult diarrhea

Antimicrobials

Antimicrobial therapy is not usually indicated in children. Antimicrobials are reliably helpful only for children with bloody diarrhea (most likely shigellosis), suspected cholera with severe dehydration, and serious nonintestinal infections (e.g., pneumonia). Antiprotozoal drugs can be very effective for diarrhea in children, especially for *Giardia*, *Entamoeba histolytica*, and now *Cryptosporidium*, with nitazoxanide.

In adults, the clinical benefit should be weighed against the cost, the risk of adverse reactions, harmful eradication of normal intestinal flora, the induction of Shiga toxin production, and the increase of antimicrobial resistance.

Antimicrobials are to be considered the drugs of choice for empirical treatment of traveler's diarrhea and of community-acquired secretory diarrhea when the pathogen is known (see Figure 11 in the original guideline document).

Considerations with regard to antimicrobial treatment:

- Consider antimicrobial treatment for:
    - Persistent *Shigella*, *salmonella*, *campylobacter*, or parasitic infections
    - Infections in the aged, immunocompromised patients, and patients with impaired resistance, sepsis, or with prostheses
    - Moderate/severe traveler's diarrhea or diarrhea with fever and/or with bloody stools — quinolones (co-trimoxazole second choice)
- Nitazoxanide is an antiprotozoal and may be appropriate for Cryptosporidium and other infections, including some bacteria.
- Rifaximin is a broad-spectrum, non-absorbed antimicrobial agent that may be useful.

Note well (N.B.):

- Erythromycin is hardly used for diarrhea today. Azithromycin is widely available and has the convenience of single dosing. For treating most types of common bacterial infection, the recommended azithromycin dosage is 250 mg or 500 mg once daily for 3 to 5 days. Azithromycin dosage for children can range (depending on body weight) from 5 mg to 20 mg per kilogram of body weight per day, once daily for 3 to 5 days.
- Quinolone-resistant *Campylobacter* is present in several areas of South-East Asia (e.g., in Thailand) and azithromycin is then the appropriate treatment.
- Treatment for amoebiasis should, ideally, include diloxanide furoate following the metronidazole, to get rid of the cysts that may remain after the metronidazole treatment.
- All doses shown are for oral administration. If drugs are not available in liquid form for use in young children, it may be necessary to use tablets and estimate the doses given in this table.
- Selection of an antimicrobial should be based on the sensitivity patterns of strains of *Vibrio (V.) cholerae* O1 or O139, or *Shigella* recently isolated in the area.
- An antimicrobial is recommended for patients older than 2 years with suspected cholera and severe dehydration.

- Alternative antimicrobials for treating cholera in children are trimethoprim/sulfamethoxazole (TMP-SMX) (5 mg/kg TMP + 25 mg/kg SMX, b.i.d. [twice a day] for 3 days), furazolidone (1.25 mg/kg, q.i.d. [four times a day] for 3 days), and norfloxacin. The actual selection of an antimicrobial will depend on the known resistance/sensitivity pattern of *V. cholerae* in the region, which requires the availability of a well-established and consistent surveillance system.
- For adults with acute diarrhea, there is good evidence that an ultrashort course (one or two doses) of ciprofloxacin or another fluoroquinolone reduces the severity and shortens the duration of acute traveler's diarrhea. This area is still controversial; use should be limited to high-risk individuals or those needing to remain well for short visits to a high-risk area.

Prevention

Water, sanitation, and hygiene:

- Safe water
- Sanitation: houseflies can transfer bacterial pathogens
- Hygiene: hand washing

Safe food:

- Cooking eliminates most pathogens from foods
- Exclusive breastfeeding for infants
- Weaning foods are vehicles of enteric infection

Micronutrient supplementation: the effectiveness of this depends on the child's overall immunologic and nutritional state; further research is needed.

Vaccines:

- *Salmonella typhi*: Two typhoid vaccines currently are approved for clinical use. No available vaccine is currently suitable for distribution to children in developing countries.
- *Shigella* organisms: Three vaccines have been shown to be immunogenic and protective in field trials. Parenteral vaccines may be useful for travelers and the military, but are impractical for use in developing countries. More promising is a single-dose live-attenuated vaccine currently under development in several laboratories.
- *V. cholerae*: Oral cholera vaccines are still being investigated, and their use is recommended only in complex emergencies such as epidemics. Their use in endemic areas remains controversial. In traveler's diarrhea, oral cholera vaccine is only recommended for those working in refugee or relief camps, since the risk of cholera for the usual traveler is very low.
- Enterotoxigenic *E. coli* (ETEC) vaccines: The most advanced ETEC vaccine candidate consists of a killed whole cell formulation plus recombinant cholera toxin B subunit. No vaccines are currently available for protection against Shiga toxin-producing *E. coli* infection.
- Rotavirus: In 1998, a rotavirus vaccine was licensed in the USA for routine immunization of infants. In 1999, production was stopped after the vaccine was causally linked to intussusception in infants. Other rotavirus vaccines are

being developed, and preliminary trials are promising. Currently, two vaccines have been approved: a live oral vaccine (RotaTeq™) made by Merck for use in children, and GlaxoSmithKline's Rotarix™.

Measles immunization can substantially reduce the incidence and severity of diarrheal diseases. Every infant should be immunized against measles at the recommended age.

Clinical Practice

Adults

Table: The Approach in Adults with Acute Diarrhea

Perform initial assessment • Dehydration • Duration (>1 day) • Inflammation (indicated by fever, bloody stool, tenesmus)	**Provide symptomatic treatment** • Rehydration • Treatment of symptoms (if necessary consider bismuth subsalicylate or loperamide if diarrhea is not inflammatory or bloody)
Stratify subsequent management • Epidemiological clues: food, antibiotics, sexual activity, travel, day-care attendance, other illness, outbreaks, season • Clinical clues: diarrhea, abdominal pain, dysentery, wasting, fecal inflammation	**Obtain fecal specimen for analysis** • If severe, bloody, inflammatory, or persistent diarrhea or if outbreak is suspected
Consider antimicrobial therapy for specific pathogens	**Report to public health authorities** • In outbreaks save culture plates and isolates; freeze fecal and food or water specimens at -70°C • Notifiable in the USA: cholera, cryptosporidiosis, giardiasis, salmonellosis, shigellosis, and infection with shiga toxin producing *E. coli*

Children

In 2004, WHO and UNICEF revised their recommendations for the management of diarrhea, including zinc supplementation as an adjunct therapy to oral

rehydration. Since then, the recommendations have been adopted by more than 40 countries throughout the world. In countries where both the new ORS and zinc have been introduced, the rate of ORS usage has dramatically increased.

Table: Principles of Appropriate Treatment for Children with Diarrhea and Dehydration

Use ORS for rehydration • Perform ORT rapidly – within 3 to 4 hours	**When rehydration is corrected - rapid realimentation** • Age- appropriate unrestricted diet • Continue breastfeeding • Regular formula feeding
Administer additional ORS for ongoing losses through diarrhea	**No unnecessary laboratory tests or medications**

Treatment for Children Based on the Degree of Dehydration

Table: Minimal or No Dehydration

Rehydration therapy: • None	**Replacement of losses**: • <10 kg body weight: 60 to 120 mL ORS for each diarrheal stool or vomiting episode	**Nutrition**: • Continue breastfeeding or age-appropriate normal diet

Table: Mild to Moderate

Note: If vomiting is persistent, the patient (child or adult) will not take ORS and is likely to need intravenous fluids.

Rehydration therapy: • ORS 50 to 100 mL/kg body weight over 3 to 4 hours	**Replacement of losses**: • <10 kg body weight: 60 to 120 mL ORS for each diarrheal stool or vomiting episode	**Nutrition**: • Continue breastfeeding, or resume normal diet after initial rehydration

Table: Severe Dehydration

Rehydration therapy:	**Replacement of**	**Nutrition**:

• Rehydrate with Ringer's lactate (100 mL/kg) intravenously within 4 to 6 hours, then administer ORS to maintain hydration until patient recovers	**losses**: • <10 kg body weight: 60 to 120 mL ORS for each diarrheal stool or vomiting episode	• Continue breastfeeding, or resume age-appropriate normal diet after initial hydration

Cautionary Note: Treating a patient with severe dehydration due to infectious diarrhea with 5% dextrose with 1/4 normal saline is unsafe. Severe dehydration occurs, usually as a result of bacterial infection (cholera, ETEC), which usually leads to more sodium loss in feces (60 to 110 mmol/L). A 1/4 normal saline solution contains sodium (Na) 38.5 mmol/L, and this does not balance the sodium losses. Intravenous infusion with 5% dextrose with 1/4 normal saline will thus lead to severe hyponatremia, convulsion, and loss of consciousness. Five percent dextrose with 1/2 standard normal saline can only be used when Ringer's lactate is not available.

The Therapeutic Approach to Acute Bloody Diarrhea (Dysentery) in Children

The main principles are: treatment of dehydration; stool cultures and microscopy to guide therapy; and frequent smaller meals with higher protein intakes. (See Figure 15 in the original guideline document for an algorithm for the therapeutic approach to acute bloody diarrhea [dysentery] in children.)

Home Management of Acute Diarrhea

With ORS, uncomplicated cases of diarrhea in children can be treated at home, regardless of the etiologic agent. Caregivers need proper instructions regarding signs of dehydration, when children appear markedly ill, or do not respond to treatment. Early intervention and administration of ORS reduces dehydration, malnutrition, and other complications and leads to fewer clinic visits and potentially fewer hospitalizations and deaths.

Indications for Patient Care	• Caregiver's report of signs consistent with dehydration • Changing mental status • Young age (<6 months old or <8 kg body weight) • History of premature birth, chronic medical conditions, or concurrent illness • Fever >38°C for infants <3 months old or >39°C for children 3 to 36 months old • Visible blood in stool • High-output diarrhea including frequent and substantial volumes • Persistent vomiting, severe dehydration, persistent fever • Suboptimal response to ORT or inability of caregiver to administer ORT • No improvement in 48 hours - symptoms exacerbate; overall condition gets worse

Self-medication in otherwise healthy adults is safe. It relieves discomfort and social dysfunction. There is no evidence that it prolongs the illness.

In adults who can maintain their fluid intake, ORS does not provide any benefits. It does not reduce the duration of diarrhea or the number of stools. In developed countries, adults with acute watery diarrhea should be encouraged to drink fluids and take in salt in soups and salted crackers. Nutritional support with continued feeding improves outcomes in children.

Among hundreds of over-the-counter products promoted as antidiarrheal agents, only loperamide and bismuth subsalicylate have sufficient evidence of efficacy and safety.

Principles of self-medication:

- Maintain adequate fluid intake.
- Consumption of solid food should be guided by appetite in adults — small light meals.
- Antidiarrheal medication with loperamide (flexible dose according to loose bowel movements) may diminish diarrhea and shorten the duration.
- Antimicrobial treatment is reserved for prescription only in residents' diarrhea or for inclusion in travel kits (add loperamide).

Family knowledge about diarrhea must be reinforced in areas such as prevention, nutrition, ORT/ORS use, zinc supplementation, and when and where to seek care (see "Indications for In-Patient Care" above). Where feasible, families should be encouraged to have ORS ready-to-mix packages and zinc (syrup or tablet) readily available for use, as needed.

Cascades

A cascade is a hierarchical set of diagnostic or therapeutic techniques for the same disease, ranked by the resources available.

Table: Cascade for Acute Watery Diarrhea – Cholera-like, with Severe Dehydration

Level 1 Intravenous fluids + antibiotics + diagnostic tests • Tests: *tetracycline, fluoroquinolone or other* + stool microscopy/culture
Level 2 Intravenous fluids + antibiotics • Empirical: *tetracycline, fluoroquinolone or other*

Level 3 Intravenous fluids + ORS
Level 4 Nasogastric tube ORS (if persistent) (vomiting)
Level 5 Oral ORS
Level 6 Oral 'home made' ORS • Salt, glucose, orange juice dissolved in water

Cautions:

- If facilities for referral are available, patients with severe dehydration (at risk of acute renal failure or death) should be referred to the nearest facility with intravenous fluids (levels 5 and 6 cannot replace the need for referral in case of severe dehydration).
- Levels 5 and 6 must be seen as interim measures and are better than no treatment if no intravenous facilities are available.
- When intravenous facilities are used, it must be ensured that needles are sterile and that needles and drip sets are never reused, to avoid the risk of hepatitis B and C.
- Do not diagnose moderate dehydration as severe dehydration and thus initiate referral for intravenous feeding because oral rehydration is more time-consuming. It is in the mother's interest to avoid the unnecessary complications that may be associated with using intravenous therapy.

Notes:

- Tetracycline is not recommended in children.
- Nasogastric (NG) feeding is not very feasible for healthy and active older children, but it is suitable for malnourished, lethargic children.
- NG feeding requires skilled staff.
- Often, intravenous fluid treatment is more easily available than NG tube feeding.
- NG feeding (ORS and diet) is especially helpful in long-term severely malnourished children (anorexia).

Table: Cascade for Acute Watery Diarrhea, Mild/Moderate, with Mild/Moderate Dehydration

Level 1 Intravenous fluids (consider) + ORS

Level 2 Nasogastric tube ORS (if persistent vomiting)
Level 3 Oral ORS
Level 4 Oral 'home made' ORS • Salt, glucose, orange juice dissolved in water

Table: Acute Bloody Diarrhea, with Mild/Moderate Dehydration

Level 1 Oral ORS + antibiotics consider for: • *S. dysenteriae* • *E. histolitica* • Severe bacterial colitis + diagnostic tests • Stool microscopy, culture
Level 2 Oral ORS + antibiotics consider for: • Empirical antibiotics for moderate/severe illness
Level 3 Oral ORS
Level 4 Oral 'home made' ORS • Salt, glucose, orange juice dissolved in water

CLINICAL ALGORITHM(S)

The original guideline document contains clinical algorithms for:

- The approach in adults with acute diarrhea
- Principles of appropriate treatment for children with diarrhea and dehydration
- The therapeutic approach to acute bloody diarrhea (dysentery) in children

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of evidence supporting the recommendations is not specifically stated for each recommendation.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Appropriate diagnosis, treatment, and management of acute diarrhea in children and adults
- Reduced morbidity and mortality from acute diarrhea

POTENTIAL HARMS

- *Antimicrobials*: In adults, the clinical benefit of antimicrobials should be weighed against the cost, the risk of adverse reactions, harmful eradication of normal intestinal flora, the induction of Shiga toxin production, and the increase of antimicrobial resistance.
- *Tetracycline* is not recommended in children.
- *Loperamide* should be avoided in bloody or suspected inflammatory diarrhea (febrile patients).
- Use of *ciprofloxacin* or another *fluoroquinolone* is still controversial; use should be limited to high-risk individuals or those needing to remain well for short visits to a high-risk area.
- *Diarrhea vaccine* use remains controversial.

CONTRAINDICATIONS

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- *Antimicrobial therapy* is not usually indicated in children.
- Loperamide is not recommended for use in children < 2 years. Significant abdominal pain suggests inflammatory diarrhea (this is a contraindication for *loperamide* use).
- In children who are in hemodynamic shock or with abdominal ileus, *oral rehydration therapy* may be contraindicated.

QUALIFYING STATEMENTS

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World Gastroenterology Organisation (WGO) Guidelines summarize what is known as published in existing systematic reviews, evidence-based guidelines, and high-quality trials. This information is then appraised and configured to make the guideline as relevant and accessible as possible globally. Sometimes this means building cascades — different approaches designed to achieve the same ends. Each approach is different, because it tries to take account of resources, cultural preferences, and policies. WGO Guidelines are not systematic reviews based on a systematic and comprehensive review of all available evidence and guidelines. These global guidelines try to distinguish between geographical areas with differing resources and differing epidemiologies, and the guidelines are then translated into French, Mandarin, Portuguese, Spanish, and Russian to facilitate relevance and access.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Clinical Algorithm
Foreign Language Translations

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Staying Healthy

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

World Gastroenterology Organisation (WGO). WGO practice guideline: acute diarrhea. Munich, Germany: World Gastroenterology Organisation (WGO); 2008 Mar. 28 p.

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2008 Mar

GUIDELINE DEVELOPER(S)

World Gastroenterology Organisation - Medical Specialty Society

SOURCE(S) OF FUNDING

World Gastroenterology Organisation (WGO-OMGE)

GUIDELINE COMMITTEE

Guidelines Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Committee Members: Prof. M. Farthing (*Chair*), (United Kingdom); Prof. G. Lindberg (Sweden); Prof. P. Dite (Czech Republic); Prof. I. Khalif (Russia); Prof. E. Salazar-Lindo (Peru); Prof. B.S. Ramakrishna (India); Prof. K. Goh (Malaysia); Prof. A. Thomson (Canada); Prof. A.G. Khan (Pakistan)

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

WGO Guidelines are constantly reviewed and updates are built when new information becomes available.

GUIDELINE AVAILABILITY

Electronic copies: Available from the World Gastroenterology Organisation (WGO-OMGE) Web site.

Print copies: Available from the World Gastroenterology Organisation (WGO-OMGE), c/o Medconnect GMBH, Brünnsteinster. 10, 81541 Munich, Germany

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Graded evidence. Professor Elewaut's essential reading. Available from the World Gastroenterology Organisation (WGO-OMGE) Web site.
- French, Mandarin, Spanish, and Portuguese translations of the original guideline. Available from the World Gastroenterology Organisation (WGO-OMGE) Web site.

Print copies: Available from the World Gastroenterology Organisation (WGO-OMGE), c/o Medconnect GMBH, Brünnsteinster. 10, 81541 Munich, Germany.

PATIENT RESOURCES

None available

NGC STATUS

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